

Nearshore Habitat Mapping in Hood Canal Using Underwater Video and Hyperspectral Imaging

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Abstract

Comprehensive, fine-scale resolution intertidal-subtidal eelgrass habitat maps were developed near the vicinity of the Hood Canal Floating Bridge as part of the Washington State Department of Transportation's plan to repair and replace portions of the bridge. The project delineated eelgrass and other habitats using a combination of georeferenced underwater video for the subtidal portion and Compact Airborne Hyperspectral Imagery (CASI) data for the intertidal portion. Each mapping technology was applied at different times of the year in the same general study area, with some spatial overlap. Sufficient resolution and precision existed to link both methods, providing a mosaic of comprehensive intertidal-subtidal eelgrass habitat. Subtidal underwater video transect data consisted of ~14,000 observations that were post-processed and classified for eelgrass density, substrate type, fish and macroinvertebrates. CASI imagery was collected along two flightlines covering the intertidal and shallow subtidal habitats. Eight intertidal landcover types were developed from the CASI imagery including dense eelgrass, sparse eelgrass, green algae, sparse green algae, brown algae, sand, gravel/cobble, and oyster shell/gravel. Correspondence in eelgrass delineation in the lower intertidal area of overlap between the two mapping methods was 86% and 95% for sparse and dense eelgrass, respectively. We believe this mosaic of intertidal-subtidal eelgrass habitat is one of the first integrated mapping efforts using underwater video and hyperspectral imaging.